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10/758,710	01/16/2004	Martin W. Rupich	30020-301001 AMSC-676US1	6546
80841 7590 02/16/2011 Occhiuti Rohlicek & Tsao LLP 10 Fawcett Street Cambridge, MA 02138				
EXAMINER WARTALOWICZ, PAUL A				
ART UNIT		PAPER NUMBER		
1735				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@ORTPATENT.COM

# Office Action Summary

**Application No.**

10/758,710

**Applicant(s)**

RUPICH ET AL.

**Examiner**

PAUL A. WARTALOWICZ

**Art Unit**

1735

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-7,9-18 and 70-72 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9-18 and 70-72 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-940)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 12/6/10
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Withdrawn Rejections***

Applicant's arguments, see pages 5-6, filed 12/6/10, with respect to the rejections under 35 USC 103 over Malozemoff (Riley), Jin, and Chen have been fully considered and are persuasive. The rejection of claims 71 and 72 (a typo was present in the Office Action mailed 9/16/10; this rejection should have included claim 72 and not claim 78) over Malozemoff, Jin, and Chen has been withdrawn.

It is noted that claims 71 and 72 stand rejected over Malozemoff in view of Jin.

### ***Response to Arguments***

Applicant's arguments filed 12/6/10 have been fully considered but they are not persuasive.

Applicant argues that Malozemoff (referred to in the office action as "Riley") does not disclose (1) a precursor solution that comprises those three salts and (2) fluoride containing salts. With regard to argument (1), applicant further argues that Malozemoff describes a precursor made with copper oxide, which is not a salt.

However, it appears that Malozemoff teaches an embodiment wherein "a precursor solution is formed of an organic solution containing metal trifluoroacetates prepared from powders of  $\text{BaCO}_3$ ,  $\text{YCO}_3 \cdot 3\text{H}_2\text{O}$  and  $\text{Cu}(\text{OH})_2\text{CO}_3$ " (page 19, lines 15-25). It appears that this teaching in Malozemoff discloses that each of the salts is a trifluoroacetate (fluoride containing salt). The claim requires that the precursor components to the metal oxide are salts and that one of the salts in the precursor

solution is a fluoride containing salt. It appears that applicant is arguing that the components which form the salts in the precursor solution are not fluoride containing salts; however, the claim does not require this. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the salts from which the precursor salts are produced being fluoride containing salts) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Additionally, the disclosure on page 25 of Malozemoff using copper oxide as a starting material for the superconducting is another formation embodiment not relied upon in the rejection below. While the embodiment on page 25 does not teach a copper salt, the embodiment on page 19 does teach a copper salt. A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Upsher-Smith Labs. v. PamLab, LLC*, 412 F.3d 1319, 1323, 75 USPQ2d 1213, 1215 (Fed. Cir. 2005). MPEP 2123 (I).

Applicant argues that page 7 does not describe constituents of a precursor solution to be disposed on the substrate.

However, the constituents of the precursor solution are described at page 19, lines 15-25.

Applicant argues that Jin suggests that partially replacing the rare earth atom with a dopant would result in insignificant flux pinning enhancements and that Applicant was able to obtain significant flux pinning enhancements and obtain an unexpected result.

However, the remarks of the Office Action mailed 3/31/10 at pages 2-3 is incorporated herein by reference. It is reiterated that a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). See also *Upsher-Smith Labs. v. Pamlab, LLC*, 412 F.3d 1319, 1323, 75 USPQ2d 1213, 1215 (Fed. Cir. 2005). MPEP 2123 (I).

Additionally, it appears that substitution of the rare earths with other rare earths results in substitution on the Ba-site concurrently. Therefore, it appears that the rare earth and alkaline earth sites are concurrently substituted partially in accordance with claims 71 and 72. The claims only require two dopants which may or may not be the same metal. The claims do not specify that the first and second dopant have to be different metals.

***Claim Objections***

Claim 71 is objected to because of the following informalities: line 2 of claim 71 recites "replaces one or more of the alkaline earth metal". However, it appears that the recitation of "one or more" is unnecessary. It is requested that "one or more of" is deleted for clarity. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3, 6, 7, 9-18, 70, 71, 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of...).

Riley teach a process of disposing a precursor solution onto a biaxially textured substrate (page 7) to form a precursor film wherein the precursor components comprise an organic solution of metal trifluoroacetates prepared from powders of salts of barium, yttrium, and copper wherein after application, the precursor is heat treated to a temperature of 300-500°C (page 19) at a rate of at least 5°C per minute (page 22) wherein the intermediate film is heated at a temperature of 700-825°C in the claimed environment (page 22).

Riley fail to teach that a dopant comprising a metal compound is in the precursor solution that is capable of replacing one or more of the rare earth and alkaline earth metal of the rare-earth/alkaline-earth/transition metal oxide.

Jin teach a method of making superconductors (page 75) wherein a YBCO superconductor with 20% of yttrium substituted with a second rare earth element (holmium is a second rare earth element used for substitution of yttrium, page 76, 78) exhibits a higher  $J_c$  than a YBCO superconductor without the substitution (page 78).

Additionally, Jin teaches that all of the starting materials are mixed together to form a precursor mixture (page 76, first column).

As Jin teaches a method of making superconductors (page 75) wherein a YBCO superconductor with 20% of yttrium substituted with a second rare earth element (holmium is a second rare earth element used for substitution of yttrium, page 76, 78) exhibits a higher  $J_c$  than a YBCO superconductor without the substitution (page 78) and that all of the starting materials are mixed together (including the dopant starting material) to form a precursor mixture (page 76, first column), it would have been

obvious to one of ordinary skill in the art at the time applicant's invention was made to add a dopant rare earth element to a precursor solution of Riley in order to make a superconductor having a higher  $J_c$  than a YBCO superconductor without the substitution (page 78) as taught by Jin.

Additionally, regarding the range of rare earth substitution in claims 1 and 3, the value of rare earth substitution taught by Jin (20%) anticipates the range claimed (up to 50% i.e. greater than zero but less than or equal to 50). "[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is anticipated' if one of them is in the prior art." *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (citing *In re Petering*, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962)) (emphasis in original) (Claims to titanium (Ti) alloy with 0.6-0.9% nickel (Ni) and 0.2-0.4% molybdenum (Mo) were held anticipated by a graph in a Russian article on Ti-Mo-Ni alloys because the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni and this composition was within the claimed range of compositions.). MPEP 2131.03 (I).

Regarding claim 6, the range of Riley of 300-500°C anticipates the claimed range of 190-650°C. "[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is anticipated' if one of them is in the prior art." *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

Regarding claim 7, the range of Riley of 300-500°C renders obvious the claimed range of 190-400°C. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).



Regarding claim 9, as Jin suggests that barium in YBCO should be substituted (page 78), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute the barium in the YBCO of Riley with another element.

Additionally, the range claimed of up to 50 atomic percent is a range that covers half of the potential substitution (greater than zero but less than a hundred percent). Therefore, it appears that a range of barium substitution would overlap with a range of up to 50 atomic percent as the range claimed includes half the possible values of possible substitution. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding 10 and 11, Riley teaches that the intermediate film is heated at a temperature of about 700-825C in a flowing gas environment having an oxygen partial pressure of 0.1-50 Torr, water vapor pressure of 0.1-150 Torr with the balance being nitrogen or argon. This teaching appears to overlap with the claim ranges. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

Regarding claims 12-17, Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water during the heating of the intermediate oxyfluoride film (page 20).

Additionally, the claimed heat ramps could be discovered through routine experimentation.

As Riley teaches that it is known to adjust temperature, vapor pressure of gaseous water (page 20) and because the claimed heat ramps could be discovered through routine experimentation, it would have been obvious to one ordinary skill in the art at the time applicant's invention was made to provide a heating ramp of greater than 200°C per minute during the heat treatment of the oxyfluoride intermediate film of Riley.

Regarding claim 18, the prior art teach a substantially similar process as that instantly claimed such that the properties resulting from the prior art process are substantially similar to those instantly claimed, including orientation.

Regarding claims 71 and 72, Jin suggests that barium in YBCO should be substituted with another element (page 78).

As Jin suggests that barium in YBCO should be substituted (page 78), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute the barium in the YBCO of Riley with another element.

Additionally, it appears that substitution of rare earth and barium site occurred simultaneously during substitution with lanthanum partial substitution in Jin (page 76, second column).

Claims 4, 5, 12-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of...) and Weinstein (U.S. 6869915).

Riley teaches a method of making a superconductor as described above in claim

Regarding claims 4 and 5, Weinstein teaches a method of making pinning centers in YBCO superconductors (col. 2) such that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6).

As Weinstein teaches that the amount of the element to substitute for an element in the superconductor is 0.01-1% of the entire material (col. 6), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to substitute an element in the superconductor of Riley with an element present in the amount of 0.01-1% of the entire material in order to provide a superconductor exhibiting flux pinning centers as taught by Weinstein.

This range appears to overlap with the range in claims 4 and 5. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. MPEP 2144.05 (I).

If Riley fails to teach the claimed heat ramps, Weinstein teaches a process for producing a superconductor wherein a precursor is heated to form an oxyfluoride intermediate film, where after the intermediate film is heated at a temperature less than 810°C (col. 11).

As Weinstein teaches a the intermediate film is heated at a temperature less than 810°C (col. 11), it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to heat the intermediate oxyfluoride film of Riley at a temperature less than 810°C (col. 11) in order to provide a superconductor exhibiting flux pinning centers as taught by Weinstein.

While Weinstein does not explicitly disclose that the intermediate film is heated instantaneously, Weinstein does recite that "the coating is heated...at a temperature of less than 810°C" (emphasis added, col. 11, lines 25-30). As this disclosure in Weinstein recites "at" a temperature rather than "to a" temperature, it appears that Weinstein teaches an instantaneous heating or a heating ramp that overlaps the claimed heating ramp.

Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of...) and Wiesmann et al. (US 2003/0050195).

Riley teaches a method of making a superconductor as described above in claim 1.

If Riley fails to teach that the intermediate film is heated at a temperature ramp of about greater than 25°C per minute, Wiesmann, however, teaches a method of making superconductors [0002] wherein a precursor film comprising Ba, Y, Cu, and F is heated from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in order to form a YBCO superconductor [0050].

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide heating a precursor film from room temperature to a temperature of 735°C at a temperature ramp of 1500°C per hour (25°C per minute) in Riley in order to form a YBCO superconductor [0050] as taught by Wiesmann.

It appears that the value of 25 overlaps with the recitation of "greater than about 25".

In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In *re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In *re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.); In *re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997). MPEP 2144.05 (I).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riley (WO 01/08169) in view of Jin (Superconducting properties of...) and Feenstra (U.S. 5972847).

Riley teaches a process for making a superconductor as described above in claim 1.

If Riley fails to teach that the oxide superconductor is biaxially oriented and that the oxide superconductor has a c-axis orientation that is substantially constant across its width, the c-axis orientation of the oxide superconductor being substantially perpendicular to the surface of the substrate, Feenstra teaches a method for making superconductors (col. 1) wherein it is known that biaxial texture is required to obtain high transport critical current densities (col. 1). Also taught is that the most favorable YBCO orientation is with c-axis perpendicular to the substrate (col. 4).

Riley teaches that a-axis oriented grains should be minimized (page 27).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide biaxial textured superconductors and c-axis perpendicular to the substrate in Riley for the purpose of obtaining high transport critical current densities the most favorable YBCO orientation is with c-axis perpendicular to the substrate as taught by Feenstra. Additionally, one would be motivated to provide c-axis orientation constant as Riley teaches that a-axis oriented grains should be minimized.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul A Wartalowicz/  
Examiner, Art Unit 1735

/Jessica L. Ward/  
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